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NR/L3/ELP/29987

Module 2

Assessment of Electrical Risks

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1 Purpose

This module provides a consistent approach to the assessment of risks when working on or about 25 kV a.c. electrified lines.

NOTE: Further requirements for working on or about the electrified lines are contained in the Rule Book Module AC (GE/RT8000/AC) and Handbook HB16 (GE/RT8000/HB16).

2 Scope

This module states the requirements for the assessment of the risk of danger arising from live overhead line equipment, and live pantographs and other roof-mounted electrical equipment on trains, when work is to be carried out on or about 25 kV a.c. electrified lines.

It is applicable to Network Rail personnel and to Network Rail's contractors.

To provide a consistent approach to working on or about 25 kV a.c. electrified lines, Train Operating Companies may, as best practice, apply this standard to infrastructure they control.

This Standard also includes:

- Work on or about any future sections of electrification on Network Rail controlled infrastructure and areas required to adopt a process for securing points of disconnection to form points of isolation to use the Supplementary Isolation Process (Module X).
- Planning of isolations, testing and earthing of overhead line equipment on Network Rail controlled infrastructure equipped with 750V d.c. overhead line system (Sheffield Tram Train Module Y).
- Planning of isolations, testing and earthing of overhead line equipment on Network Rail controlled infrastructure equipped with 1500V d.c. overhead line system (Sunderland Metro Systems Operating Area – Module Z).

3 Reduced Wire Height

3.1 Areas of Reduced Wire Height

There are certain areas of the network where the overhead line equipment is registered at a height lower than 4.14 metres (13 feet 7 inches) above rail level.

NO WORK SHALL BE UNDERTAKEN IN AN AREA OF REDUCED WIRE HEIGHT WHEN THE OVERHEAD LINE EQUIPMENT IS LIVE, OTHER THAN IN EXCEPTIONAL CASES WHEN:

- a) it is not reasonably practicable for the overhead line equipment to be isolated; or
- b) the specific task to be undertaken is judged 'low risk' by a competent person following consultation with relevant risk assessments and approved task delivery method.

In cases where isolation is considered not reasonably practicable, work shall only proceed if a documented safe system of work has been produced by a Competent

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Person in accordance with Module 3 of this standard and been approved by the Delivery Unit Electrification and Plant Maintenance Engineer or Designated Project Engineer.

3.2 Use of On-Track Plant in Areas of Reduced Wire Height

Only on-track plant that has been suitably assessed, and granted **specific authorisation**, may operate in an area of reduced wire height. Network Rail NR/L2/RMVP/0200 states the requirements when using plant on Network Rail managed infrastructure.

Clause 4.2 of this document shall NOT APPLY for work undertaken in an area of reduced wire height.

In such areas the requirements of clause 4.3 must be adhered to at all times, regardless of separation distance from live equipment.

4 Assessment of Risk Before Attempting Work

4.1 General

Before any work is attempted on or about the electrified lines, the proposed work shall be subjected to risk assessment in relation to the danger from the live parts of the OLE, and live pantographs and other roof-mounted electrical equipment on trains.

When assessing risk, consideration shall be given to the possibility of the proposed work causing damage to the overhead line equipment including those parts which are not live, e.g. OLE supporting structures, headspan wires and other earthed wires. Consideration shall also be given to live abutting or adjacent Network Rail (High Speed 1 Ltd), Rail For London Infrastructure Limited (Elizabeth Line) or South Yorkshire Supertram Limited (Sheffield Supertram) lines which are separately fed and controlled.

Additionally, consideration shall be given, where appropriate, to the possibility of induced voltages in unearthed metalwork, or infrastructure including wires/cables that are to be disconnected. Network Rail standard NR/SP/ELP/21085 states the requirements for the design of earthing and bonding for a.c. electrified lines.

4.2 Work More Than 2.75 metres (9 feet) from Live Equipment (See Appendix A)

This clause does NOT APPLY to work undertaken in an area of reduced wire height. See clause 3.1 for information on these areas and alternative requirements.

When work is to be attempted which is UNLIKELY to result in any part of a person's body or clothing, or anything to be used:

- a) coming within 2.75 metres (9 feet) of any live part of the OLE; and/or
- b) within the vertically unbounded space above 2.75 metres to either side of the live OLE; and/or

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- c) within 2.75 metres of live pantographs and other roof-mounted electrical equipment on trains.

A risk assessment shall be undertaken and a documented safe system of work shall be prepared by a competent person in accordance with Module 3.

The work shall be carried out strictly in accordance with the documented safe system of work authorised by the competent person.

4.3 Work Less Than 2.75 metres (9 feet) but More Than 600 millimetres (2 feet) from Live Equipment (See Appendix A)

When work is to be attempted which can, or is LIKELY to, result in any part of a person’s body or clothing or anything to be used:

- a) coming within 2.75 metres (9 feet) but NOT within 600 millimetres (2 feet) of any live part of the OLE; and/or
- b) within the vertically unbounded space above 2.75 metres to either side of the live OLE; and/or
- c) within 2.75 metres but NOT within 600 millimetres of live pantographs and other roof-mounted electrical equipment on trains.

A risk assessment shall be undertaken and a documented safe system of work shall be prepared by a competent person in accordance with Module 3.

In areas of reduced wire height the requirements of this clause shall be met at all times regardless of separation distance from live equipment

The risk assessment and safe system of work shall be reviewed and authorised as follows:

Work type	Authorised by
Maintenance	Delivery Unit Electrification and Plant Maintenance Engineer
Projects	Designated Project Engineer

Table 1 – Authorisers of risk assessments and safe systems of work

Where the DPE is not competent in assessment of electrical risks, they shall seek the advice of an identified competent engineer. Competent engineers are those identified as competent in writing by the Route Asset Manager (E&P).

Network Rail product approved catenary retention system may be used on third party powerlines within the vertically unbounded space above 2.75 metres to either side of the OLE without additional authorisation, provided 2.75m clearance is still maintained to the live OLE. This applies when the approved catenary retention system is used in line with the pre-approved method statement.

Although no requirement for the DUE&PME or DPE to authorise the risk assessment or method statement, they shall be consulted prior to the use of the product

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approved catenary retention system. The work shall be carried out strictly in accordance with the authorised safe system.

Do not attempt any work which can, or is **LIKELY** to, result in any part of a person's body or clothing coming within 600 millimetres (2 feet) of any live part of the OLE or live pantographs and other roof-mounted electrical equipment on trains.

4.4 Work Less Than 600 millimetres (2 feet) from Live Equipment (See Appendix A)

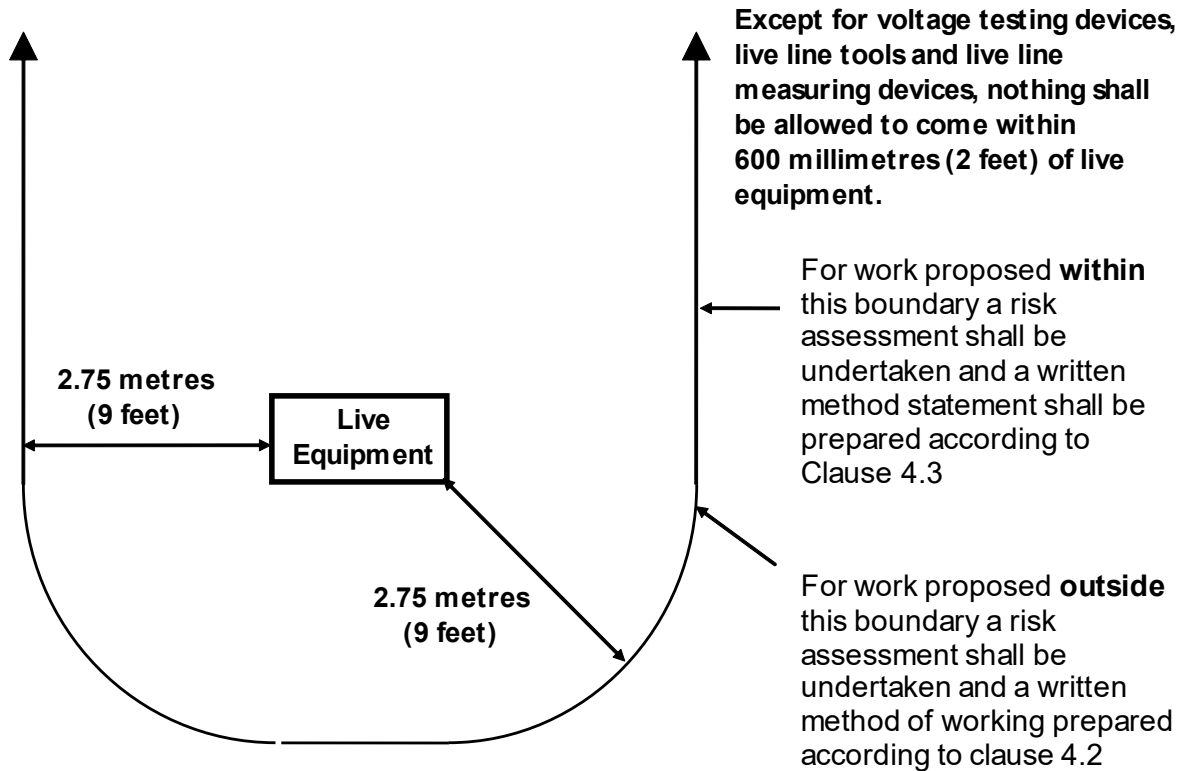
Work within 600 millimetres (2 feet) of live equipment is classed as on or near live equipment.

EXCEPT for voltage testing devices, live line tools and live line measuring devices conforming to the relevant Network Rail standards and used in accordance with the relevant Network Rail standards, **NO** work shall be attempted which will, or is **LIKELY** to, result in anything which a person is using coming within 600 millimetres of any live part of the OLE or live pantographs and other roof-mounted electrical equipment on trains.

Work shall not be carried out at less than 600 millimetres from the equipment unless the appropriate OLE has been isolated, where necessary, and earthed and an overhead line permit received in accordance with Rule Book Module AC (GE/RT8000/AC) and Handbook HB16 (GE/RT8000/HB16).

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Appendix A
Diagram of Dimensions for Working Relative to Live Parts of the OLE, Live Pantographs and Other Roof-Mounted Electrical Equipment on Trains



Not to scale

RAIL LEVEL

